

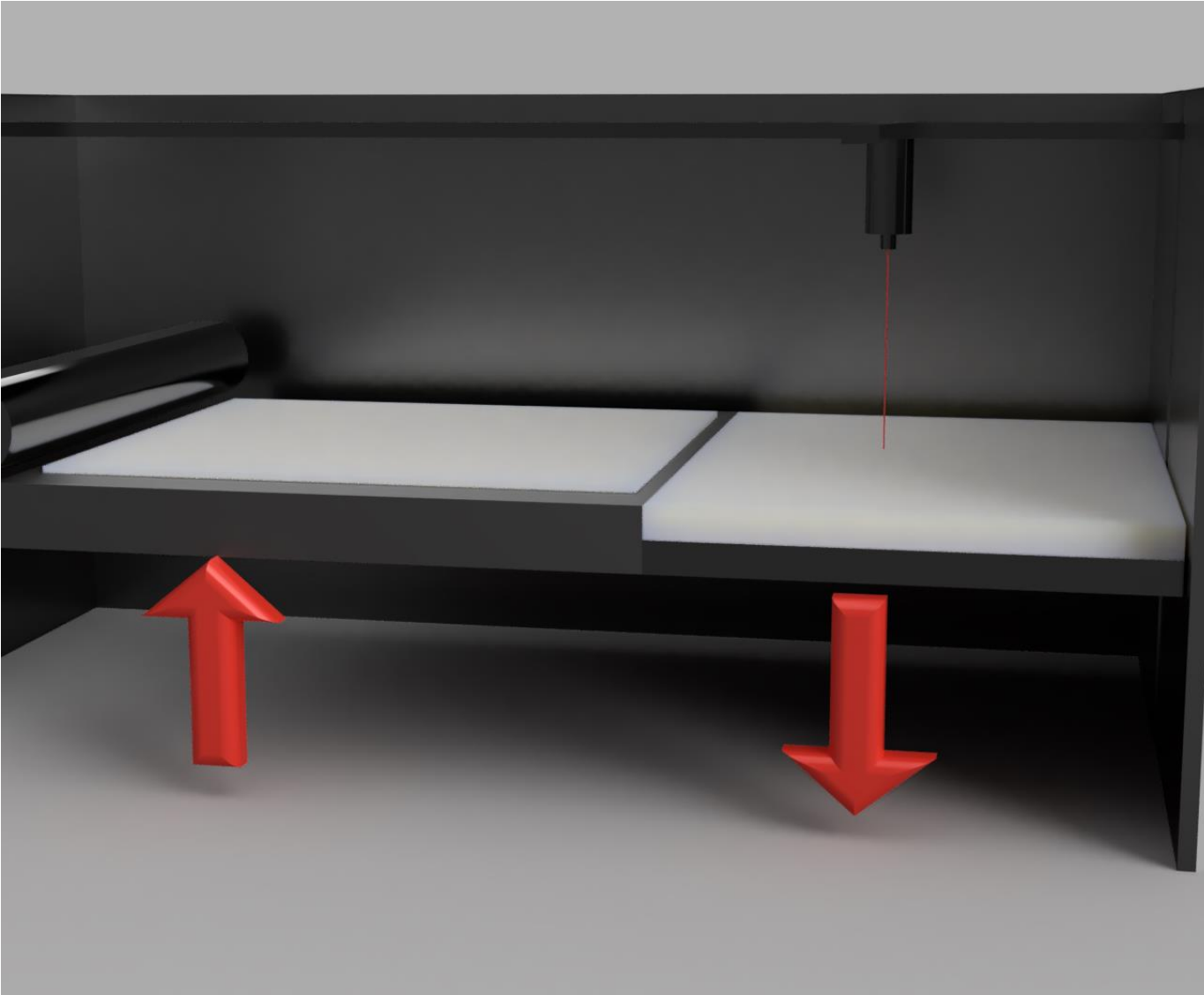
3D-Printing technologies

Powder bed fusion

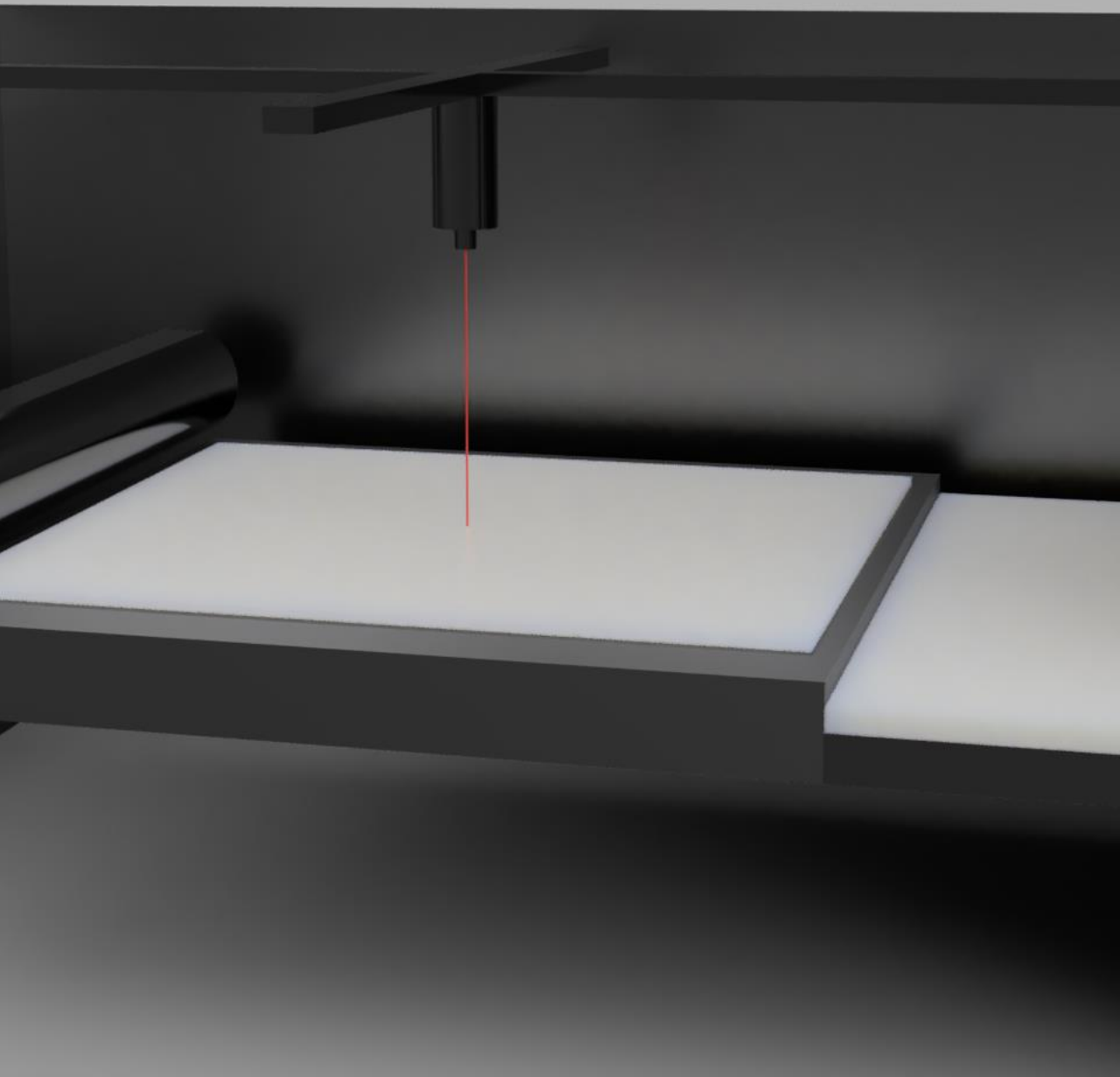
DMLS

DMLS

DMLS



- DMLS – Direct Metal Laser Sintering
- Working principle is to use a laser to melt metal powder
- Laser moves either in X- and Y- directions or it is moved with the help of mirrors
- Printing platform lowers after each finished layer, then roller sweeps over



DMLS

- Basically same as SLS, but uses metal powder, more powerful laser and chamber heats up more
- All the oxygen needs to be removed and replaced with inert gas
- Requires some type of supports with parts, because of the heat expansion
- Materials include steel, titanium, aluminum, tool steel and more are being developed

Printers

DMLS

Teolliset laitteet

SLM 280 Production Series



- XY-resolution 80 - 115 μm
- Z-resolution 20 - 90 μm
- Build volume 280 x 280 x 365 mm
- Price 250k €+

EOS M 290



- XY-resolution 100 μm
- Z-resolution 100 μm
- Build volume 250 x 250 x 325 mm
- Price 250k €+

“Kuluttajalaitteet”

OneClickMetal MPrint



- XY-resolution 100 μm
- Z-resolution 20 – 200 μm
- Build volume 150 x 150 x 150 mm
- Price around 55 000 €

Picture : oneclickmetal.com

Sharebot MetalOne)



- XY-resolution 40 μm
- Z-resolution 5 - 200 μm
- Build volume 65 x 65 x 100 mm
- Price around 90000 €

Picture: sharebot.it

Applications

DMLS

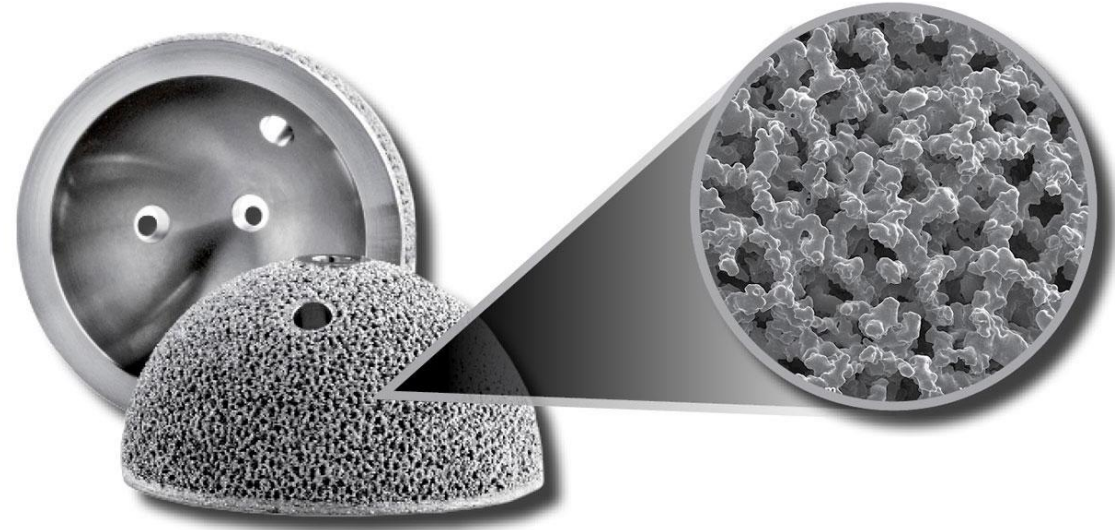


Picture: <https://www.vossi.fi/valmistajat/slm-solutions/>



Picture: Vossi, Jurec ja Arup

Machined parts 2.0

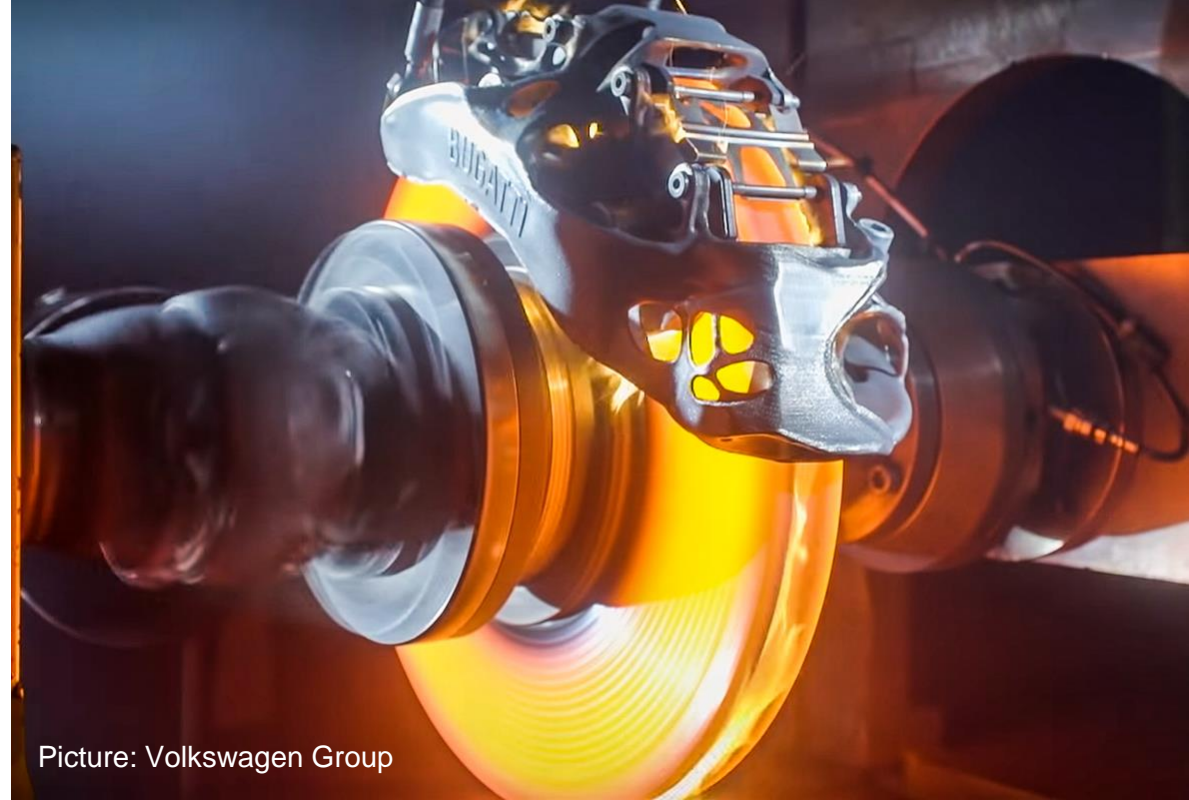


Picture: <https://3dprint.com/163831/3d-printing-the-future-of-surgery/>

Medical



Picture: TechRepublic



Picture: Volkswagen Group

Car industry

Pros vs cons

Pros

- Material recyclability
- Parts are durable
- Not much post-processing
- Every growing material library

Cons

- Full clean after each print and material change
- Requires inert gas
- Requires own space, because of powder
- Expensive
- Small build volume